CLAIM AMENDMENTS

1-22 (cancelled)

23. (new) An ethylene copolymer which is a copolymer of ethylene and an α-olefin of 3 to 20 carbon atoms and has the following properties:

(a) the melt index (MI2) at 190°C under a load of 2.16 kg is in the range of 0.0001 to 1000 g/10 min,

(b) the density is not more than 0.899 g/cm^3,

(c) the relationship between a vinyl group amount and MI2 of the polymer satisfies the following expressions:

(vinyl group amount: number of vinyl groups/1000 carbon atoms) $\leq 0.018038+0.003259 \times \log(MI2)$, and

(vinyl group amount: number of vinyl groups/1000 carbon atoms) $\leq 0.004509+0.000815 \times \log(MI2)$,

and

(d) the relationship between a vinylidene group amount and MI2 of the polymer satisfies the following expressions:

(vinylidene group amount: number of vinylidene groups/1000 carbon atoms) $\leq 0.018038+0.003259 \times \log(MI2)$, and

(vinylidene group amount: number of vinylidene groups/1000 carbon atoms) $\leq 0.013528+0.002445 \times \log(MI2)$.

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24. (new) An ethylene copolymer which is a copolymer of ethylene and an α-olefin of 3 to 20 carbon atoms and has the following properties:

(a) the melt index (MI2) at 190°C under a load of 2.16 kg is in the range of 0.0001 to 1000 g/10 min,

(b) the density is in the range of 0.875 to 0.899 g/cm^3, and

(c) the relationship between a vinyl group amount and MI2 of the polymer satisfies the following expressions:

(vinyl group amount: number of vinyl groups/1000 carbon atoms) $\leq$ 0.018038+0.003259$\times$log(MI2), and

(vinyl group amount: number of vinyl groups/1000 carbon atoms) $\leq$ 0.004509+0.000815$\times$log(MI2).

25. (new) An ethylene copolymer which is a copolymer of ethylene, an α-olefin of 3 to 20 carbon atoms and a cycloolefin and has the following properties:

(a) the cycloolefin content is not less than 0.01 % by mol,

(b) the melt index (MI2) at 190°C under a load of 2.16 kg is in the range of 0.0001 to 1000 g/10 min,

(c) the relationship between a vinyl group amount and MI2 of the polymer satisfies the following expression:

(vinyl group amount: number of vinyl groups/1000 carbon atoms) $\leq$ 0.018038+0.003259$\times$log(MI2),

and

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(d) the relationship between a vinylidene group amount and MI2 of the polymer satisfies the following expression:

(vinylidene group amount: number of vinylidene groups/1000 carbon atoms) $\leq 0.018038+0.003259 \times \log(\text{MI2})$.

26. (new) The ethylene copolymer as claimed in claim 25, wherein the ethylene copolymer further has the following properties:

the relationship between a vinyl group amount and MI2 of the polymer satisfies the following expression:

(vinyl group amount: number of vinyl groups/1000 carbon atoms) $\leq 0.004509+0.000815 \times \log(\text{MI2})$,

and

the relationship between a vinylidene group amount and MI2 of the polymer satisfies the following expression:

(vinylidene group amount: number of vinylidene groups/1000 carbon atoms) $\leq 0.013528+0.002445 \times \log(\text{MI2})$.

27. (new) The ethylene copolymer as claimed in any one of claims 23 to 26, wherein regio-regularity of the α-olefin of 3 to 20 carbon atoms, as measured by ^{13}C-NMR, satisfies the following expression:

$T\alpha\beta/(T\alpha\beta+T\alpha\alpha) \leq 0.25-0.0020x$

wherein $T\alpha\beta$ is a peak intensity of a carbon atom having branches at the α-position and the β-position in the ^{13}C-NMR spectrum, $T\alpha\alpha$

is a peak intensity of a carbon atom having branches at both of the α-positions, and x is an ethylene content (% by mol) in the polymer.

28. (new) The ethylene copolymer as claimed in claim 23, wherein regio-regularity of the α-olefin of 3 to 20 carbon atoms, as measured by ^{13}C-NMR, satisfies the following expression:

$T\beta\gamma/(T\beta\gamma+T\beta\beta) \leq 0.30-0.0015x$

wherein $T\beta\gamma$ is a peak intensity of a carbon atom having branches at the β-position and the γ-position in the ^{13}C-NMR spectrum, $T\beta\beta$ is a peak intensity of a carbon atom having branches at both of the β-positions, and x is an ethylene content (% by mol) in the polymer.

29. (new) The ethylene copolymer as claimed in claim 23, wherein the molecular weight distribution (Mw/Mn), as measured by GPC, is in the range of 1.2 to 10.

30. (new) The ethylene copolymer as claimed in claim 23, wherein the molecular weight distribution (Mw/Mn), as measured by GPC, is in the range of 1.6 to 10.

31. (new) The ethylene copolymer as claimed in claim 23, which satisfies the expression MI10/MI2 < (Mw/Mn)+5.55.

32. (new) The ethylene copolymer as claimed in claim 23, which satisfies the expression $MI2 > 19.009 \times (\eta)^{-5.2486}$.

33. (new) The ethylene copolymer as claimed in claim 23, wherein the ash content in the ethylene copolymer is not more than 1000 ppm.

34. (new) The ethylene copolymer as claimed in claim 23, wherein the titanium element content in the ethylene copolymer is not more than 10 ppm, and/or the zirconium element content in the ethylene copolymer is not more than 10 ppm.

35. (new) The ethylene copolymer as claimed in claim 23, which is a copolymer prepared by forming not less than 50 % of chain transfer by the addition of hydrogen.

36. (new) A molded product comprising the ethylene copolymer of claim 23.

37. (new) A resin modifier comprising the ethylene copolymer of claim 23.

38. (new) A composition comprising the ethylene copolymer of claim 23.

39. (new) The composition as claimed in claim 38, wherein the thermoplastic polymer is a polyolefin.

40. (new) The composition as claimed in claim 38, wherein the weight ratio of the ethylene copolymer to the thermoplastic polymer is in the range of 0.01/99.99 to 99.99/0.01.

41. (new) A molded product comprising the ethylene copolymer composition of claim 38.

42. (new) An ethylene copolymer which is a copolymer of ethylene and an α-olefin of 3 to 20 carbon atoms and has the following properties:

(a) the melt index (MI2) at 190°C under a load of 2.16 kg is in the range of 0.0001 to 1000 g/10 min,

(b) the density is not more than 0.899 g/cm^3,

(c) the relationship between a vinyl group amount and MI2 of the polymer satisfies the following expression:

(vinyl group amount: number of vinyl groups/1000 carbon atoms) $\leq 0.018038+0.003259 \times \log(\text{MI2})$,

and

(d) the relationship between a vinylidene group amount and MI2 of the polymer satisfies the following expression:

(vinylidene group amount: number of vinylidene groups/1000 carbon atoms) $\leq 0.018038+0.003259 \times \log(\text{MI2})$, and

wherein the ash content in the ethylene copolymer is not more than 1000 ppm.

43.   (new) An ethylene copolymer which is a copolymer of ethylene and an α-olefin of 3 to 20 carbon atoms and has the following properties:

(a) the melt index (MI2) at 190°C under a load of 2.16 kg is in the range of 0.0001 to 1000 g/10 min,

(b) the density is not more than 0.899 g/cm^3,

(c) the relationship between a vinyl group amount and MI2 of the polymer satisfies the following expression:

(vinyl group amount: number of vinyl groups/1000 carbon atoms) $\leq 0.018038 + 0.003259 \times \log(MI2)$,

and

(d) the relationship between a vinylidene group amount and MI2 of the polymer satisfies the following expression:

(vinylidene group amount: number of vinylidene groups/1000 carbon atoms) $\leq 0.018038 + 0.003259 \times \log(MI2)$, and

wherein the titanium element content in the ethylene copolymer is not more than 10 ppm, and/or the zirconium element content in the ethylene copolymer is not more than 10 ppm.

44. (new) An ethylene copolymer which is a copolymer of ethylene and an α-olefin of 3 to 20 carbon atoms and has the following properties:

(a) the melt index (MI2) at 190°C under a load of 2.16 kg is in the range of 0.0001 to 1000 g/10 min,

(b) the density is not more than 0.899 g/cm^3,

(c) the relationship between a vinyl group amount and MI2 of the polymer satisfies the following expression:

(vinyl group amount: number of vinyl groups/1000 carbon atoms) $\leq 0.018038+0.003259 \times \log(MI2)$,

and

(d) the relationship between a vinylidene group amount and MI2 of the polymer satisfies the following expression:

(vinylidene group amount: number of vinylidene groups/1000 carbon atoms) $\leq 0.018038+0.003259 \times \log(MI2)$,

which is a copolymer prepared by forming not less than 50 % of chain transfer by the addition of hydrogen.

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